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Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	)	
	)	
Carriage of the Transmissions	)	CS Docket No. 98-120
of Digital Television Broadcast Stations	)	
	)	
Amendments to Part 76	)	
of the Commission's Rules	)	

COMMENTS OF GENERAL INSTRUMENT CORPORATION

General Instrument Corporation ("GI") submits the following comments in response to the Notice of Proposed Rulemaking ("Notice")[1] in the above-captioned proceeding.

Interest of General Instrument Corporation

General Instrument is a leading world supplier of systems and components for high performance networks delivering video, voice and Internet/data services to the cable, satellite, MMDS and telephony markets. GI built the first all-digital high definition broadcast television system ("HDTV") for testing by the Commission's Advisory Committee on Advanced Television Service. GI was a member of the Grand Alliance of companies that developed the HDTV system upon which the current broadcast standard is

[1] In the Matter of Carriage of the Transmissions of Digital Television Broadcast Stations, Amendments to Part 76 of the Commission's Rules, CS Docket No. 98-120, FCC 98-153, released July 10, 1998 ("Notice").

based. GI is also an active participant in several industry standards-setting organizations, including the Society of Cable Telecommunications Engineers ("SCTE").

Summary of Position

In considering rules for carriage of broadcast signals by cable television systems, the Commission is faced with extremely complex business and regulatory environments. Further complicating this proceeding is the fact that such carriage raises difficult technical issues. As the leading supplier of digital systems and equipment for cable television systems, GI files these comments to provide the Commission with information concerning the status and development of cable television technology and to comment particularly with respect to two current issues: receiver interface standards and PSIP.

Despite the complex technical issues raised by digital must-carry, there has been significant progress in the development of industry standards and practices, resulting from business arrangements and the activities of industry standard-setting organizations. For this reason, we believe the Commission should not regulate these matters but should give the market and these organizations wide latitude in finding solutions for carriage.

The Current State of Set-Top Terminal Technology

The Commission has sought information on the current state of set-top technology as it relates to the carriage of digital broadcast signals.[2] GI has installed over 600 digital headend systems for cable operators throughout the United States. Over two million

[2] Notice at ¶ 27.

digital set-top converters have been shipped by GI to these operators. These digital cable systems provide consumers with superior audio and video quality, increased numbers of channels, pay-per-view, interactive program guides, video-on-demand services, and more. Advanced models of this set-top converter are in the development pipeline for deployment in 1999.

The current generation of set-top terminals is capable of receiving standard definition television (SDTV) and providing these signals to television receivers in analog format on a baseband audio/video connection or on an RF connection to the television's tuner. They are designed for use in cable television and/or MMDS networks, and are capable of receiving signals modulated using either 64 or 256 QAM, maximizing the carriage capacity and performance of the cable TV system. These units are available with a remote controlled by-pass switch that allows the digital set-tops to be bypassed by the HDTV signal for viewing directly on digital receivers. These digital set-top terminals also have a serial high-speed data port on the back that can be used with a new line of HDTV decoders, which will be introduced in 1999, to deliver high definition programming to the forthcoming digital television receivers. The high definition programming services are processed by the access control system in the set-top terminal, permitting the delivery of subscription, pay-per-view, or video-on-demand high definition services to the subscriber.

The next generation of set-tops to be delivered to customers beginning in mid-1999 will include industry standard operating systems and related software from leading vendors like Microsoft, NCI and Sony. Extended functionality, such as new applications

and access to the Internet, can be downloaded into these products from the cable TV network. These set-tops will have processing capabilities of over 200 MIPS and sufficient memory to truly support the convergence of the Internet and television.

Interface Standards

The Commission has sought comment as to whether it should consider rules, or other appropriate action, e.g., establishment of a deadline, to ensure that both the set-top terminal and the digital receiver are IEEE-1394-compatible.[3] GI supports the establishment of a standard but we believe that some work is required in order to overcome certain implementation issues with the proposed standard.[4] In our view, however, it is not necessary to establish a deadline for introduction of the proposed IEEE-1394 format and we recommend that the Commission consider whether the 1394 interface is the best interface between digital TV receivers, VCRs and cable set-top terminals. Other viable methods for connecting the set-top terminal and the digital TV are available, including the high performance component analog interface standard (YPrPb) with the required control channels, which has recently been adopted as a CEMA standard (CEMA 770.3). We note that many TV receiver manufacturers appear to be employing

[3] Notice at ¶ 28.

[4] As part of the industry consideration of the OpenCable Home Device Network Interface ("HDNI") within the Digital Video Subcommittee of SCTE, concerns have been expressed that the 1394 format is inadequate for many applications which require complex displays overlaid on the television program content or displayed as standalone services (e.g., Web browsing from a navigation device, downloaded electronic games, etc.).

this interface in their early digital TV receivers. In many respects, YPrPb is a more robust interface than 1394 and it will be available sooner.

GI intends to provide a family of set-top terminals with models that support all industry interfaces, including eventually 1394 when the HDNI standard is complete and components are available. However, GI would like to see the market determine the most cost effective and flexible solutions. Consumer interest is best served when market forces are permitted to select between viable standards. Regulatory action should be avoided wherever possible since this can lead to inefficient and static solutions that cannot evolve to meet new service requirements.

PSIP and Channel Positioning Issues

The Commission has sought comment on Program and System Information Protocol (PSIP) in connection with channel positioning issues.[5]

As noted earlier, GI has shipped over two million converters and the vast majority are already in use providing digital television service to consumers. These converters operate with the SI system information protocol to carry the ancillary data on the out-of-band channel which is described in ATSC A/56,[6] and they neither support the PSIP protocol described in A/65 nor contain any facility for processing the PSIP data transmissions. However, all of the functionality of PSIP can be accommodated using extensions to the A/56 SI format.

In the analog television world, broadcasters were able to transmit ancillary data in the vertical blanking interval of the TV signal and cable operators were able to transmit ancillary data in an out-of-band data channel. For analog broadcasting, this data might include closed captioning, content advisory ratings, ghost cancellation signals, audience measurement signals, and program guide services, among others. For cable television, this data might include any of the broadcast data as well as entitlement messages for conditional access systems.

In a digital television world, while cable systems still employ an out-of-band channel, there is no longer a vertical blanking interval for broadcasters to use. However, ancillary data packets may be time multiplexed into the stream of audio and video packets.[7]

General Instrument's architecture for digital cable systems was completed several years ago, and, as noted above, GI employed the SI protocol that was standardized by the Society of Cable Telecommunications Engineers (SCTE) as voluntary standards DVS-011 and DVS-022.

When it became clear that broadcasters would need a similar protocol for ancillary data transmission on digital channels, GI submitted its SI specification to the Advanced Television Systems Committee (ATSC), where it was standardized as voluntary standards document A/56. However, many months later, after the industry had committed to deploy millions of cable TV digital decoders based on A/56, broadcasters sought

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[5] Notice at ¶¶ 80-82.

additional capabilities that are not needed by cable systems. In particular, they sought to include a two-part channel number plan to allow viewers to navigate among the multiple standard definition programs that might be carried within a 6 MHz digital television signal.[8] That led to the development and adoption of PSIP by ATSC as standards document A/65, which, in fact, includes elements of A/56 but is not backwards compatible with A/56. Given equipment costs, it would be burdensome on cable operators, particularly the thousands of smaller operators, to create and inject PSIP data into the 6 MHz channels used for cable programming services. Instead, on cable systems, the SI data carried on the out-of-band channel will serve as the primary source of data for navigating and for channel positioning. For small cable networks, this information is provided from a common source, and distributed via satellite in A/56 format to reduce costs. SI provides complete flexibility in the assignment of virtual channel numbers to TV broadcast programming.

Conclusion

The cable industry's transition to digital is well underway. With this in mind, General Instrument respectfully urges the Commission to allow market solutions to

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[6] Also promulgated as SCTE DVS 011/022.

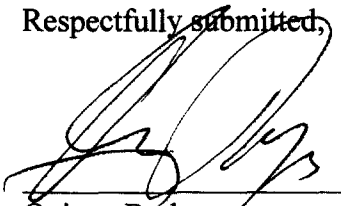
[7] There may be additional ways to carry such ancillary information.

[8] Cable television systems do not need two part channel numbering because with SI they already have the capability to assign virtual channel numbers to programs; virtual channel numbers are independent of the RF channel number on which the programs are carried. In contrast, prior to PSIP, broadcasters have never had an ability to create virtual channel numbers and TV sets have never had an ability to tune to multiple programs within a 6 MHz channel.

[9] See http://www.atsc.org/stan&rps.html, Notice Regarding Documents Regarding A/55 and A/56.

govern the transition to digital broadcast television, including complex technical issues such as the receiver interface and system information. GI believes that the technical issues involved, although complex, can be best handled by private standard-setting organizations and through the business agreements reached between broadcasters and cable operators. The Commission should avoid the adoption of standards that may only serve to limit innovation and stifle consumer choice.

Respectfully submitted,



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